

CLAIMS:

1. A network device comprising:

at least one network port configured to send and receive a data packet;

a clock generating a timing signal;

address resolution logic (ARL) tables configured to store and maintain network address data;

address resolution logic coupled to said ARL tables and configured to perform a search of said ARL tables based on said data packet, and to perform an update based on a learning function, said search and said update being performed concurrently during alternating slots of said timing signal; and

range calculation logic configured to calculate a current range of said search;

wherein said address resolution logic is configured to determine an intended result of said update and to block said update when said intended result will move data out of said current range of said search.

2. The network device of claim 1, wherein said address resolution logic is configured to perform multiple searches in said ARL tables concurrently, to perform multiple updates based on results of said multiple searches, and to determine an intended result of each of said updates, said range calculation logic is configured to determine a current range of each of said multiple searches, and said address resolution logic is configured to

block any update of said updates which has an intended result which will move data out of any said current range of each of said multiple searches.

3. The network device of claim 1, wherein said search comprises a binary search and said range calculation logic is configured to determine said current range based on a number of rows in said ARL tables, a current step of said search, and a current location of said search.

4. The network device of claim 2, wherein each of said searches comprises a binary search and said range calculation logic is configured to determine said current range based on a number of rows in said ARL tables, a current step of said each of said searches, and a current location of said each of said searches.

5. The network device of claim 1, wherein said address resolution logic is configured to insert a record into said ARL tables based on said learning function and to perform a bubble sort when inserting said record into said ARL tables, said bubble sort generating said update.

6. The network device of claim 2, wherein said address resolution logic is configured to insert a record into said ARL tables based on results of each of said multiple searches and to perform a bubble sort for each insert, said bubble sorts generating said updates.

7. A network device comprising:

at least one network port configured to send and receive a data packet;

a clock means for generating a timing signal;

address resolution logic (ARL) tables means for storing and maintaining network address data;

address resolution logic means for coupling to said ARL tables and for performing a search of said ARL tables based on said data packet, and performing an update based on a learning function, said search and said update being performed concurrently during alternating slots of said timing signal; and

range calculation logic means for calculating a current range of said search;

wherein said address resolution logic means is configured to determine an intended result of said update and to block said update when said intended result will move data out of said current range of said search.

8. The network device of claim 7, wherein said address resolution logic means is configured to perform multiple searches in said ARL tables means concurrently, to perform multiple updates based on results of said multiple searches, and to determine an intended result of each of said updates, said range calculation logic means is configured to determine a current range of each of said multiple searches, and said address resolution logic means is further configured to block any update of said updates which

has an intended result which will move data out of any said current range of each of said multiple searches.

9. The network device of claim 7, wherein said search comprises a binary search and said range calculation logic means is configured to determine said current range based on a number of rows in said ARL tables means, a current step of said search, and a current location of said search.

10. The network device of claim 8, wherein each of said searches comprises a binary search and said range calculation logic means is configured to determine said current range based on a number of rows in said ARL tables means, a current step of said each of said searches, and a current location of said each of said searches.

11. The network device of claim 7, wherein said address resolution logic means is configured to insert a record into said ARL table means based on said learning function and to perform a bubble sort when inserting said record into said ARL tables means, said bubble sort generating said update.

12. The network device of claim 8, wherein said address resolution logic means is configured to insert a record into said ARL table means based on results of each of said multiple searches and to perform a bubble sort for each insert, said bubble sorts generating said updates.

13. A method for performing learning and searching concurrently in a network device, said method comprising the steps of:

providing a network device comprising at least one port for receiving a data packet, ARL tables configured to store and maintain network address data, and address resolution logic couple to said ARL tables and configured to search and update data into said ARL tables based on said data packet;

generating a timing signal;

receiving at least one data packet at said at least one port;

initiating at least one search of said ARL tables based on said at least one data packet;

determining a current range of said at least one search;

performing an insert into said ARL tables based on results of any searches to said ARL tables to perform a learning function;

performing at least one update to data in said ARL tables based on said learning;

determining an intended result of said at least one update; and

blocking said at least one update when said intended result correlating to said at least one update will move data out of said current range;

wherein said at least one search and at least one update being performed during alternating slots of said timing signal.

14. The method of claim 13, wherein said initiating at least one search step comprises initiating at least one binary search, said determining

a current range step comprises determining said current range based on a number of rows in said ARL tables, a current step of said at least one search, and a current location of said at least one search.

15. The method of claim 13, wherein said performing learning step comprises inserting data into said ARL tables and bubble sorting said data in said ARL tables based on said insert, said bubble sorting generating said at least one update.

16. The method of claim 15, wherein said blocking step comprises changing a data write of said bubble sorting correlating to said at least one update into a data read for one cycle of said clock signal.